DOCUMENT RESUME

ED 297 272 CS 009 223

AUTHOR Freeman, Ruth H.
TITLE Recall of Central Facts from Text.
PUB DATE Dec 85
NOTE 15p.; Paper presented at the Annual Meeting of the National Reading Conference (35th, San Diego, CA, December 3-7, 1985).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Content Area Reading; Intermediate Grades; Memorization; *Reading Comprehension; Reading Skills; *Recall (Psychology); *Retention (Psychology); *Text Structure
IDENTIFIERS *Elaboration Theory; Text Factors

ABSTRACT

A study investigated the relation of text structure to information retained by readers. The premise investigated was that memory for the central facts of a passage will be enhanced by the presence of related information as theorized in the encoding elaboration model (developed by Anderson and Reder in 1979). This model states that comprehension and memorability are dependent on the process of elaboration that takes place during reading. Subjects, 64 sixth grade students from three classes at one elementary school, participated in two experimental sessions and were instructed to read to remember (the selection was about Abraham Lincoln), and be able to write the information contained in the passage. The reading-study session lasted for 20 minutes. Then the passage was collected and the subjects were instructed to write everything they could remember. The recall session lasted 15 minutes. Three days later, in an unannounced session, the subjects were asked to recall everything they had learned from the passage and write everything they could remember. The subjects were given 20 minutes to write. The immediate and delayed recalls were scored for the presence or absence of the 18 central facts. The results fulfilled the expectations of the model and indicated a strong support for the hypothesis that memory for the central facts of a passage is enhanced by the presence of related information. Examination of the immediate and delayed mean recall levels showed a reduced attrition rate for central facts supported by details compared to unsupported central facts. (Two tables of data and 13 references are attached.) (RAE)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED297272

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Ruth H. Freeman
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

RECALL OF CENTRAL FACTS FROM TEXT

RUTH H. FREEMAN
School District of the City of Royal Oak
4137 Colonial Drive
(313) 549-3494

CS209223

RUTH H. FREEMAN
School District of the City of Koyal Oak

RECALL OF CENTRAL FACTS FROM TEXT

This study is one of a series that investigated the relation of text structure to information retained by readers. In these studies the experimental passages were written to be representative of social studies texts from which upper elementary level students are expected to learn new information. The premise investigated is that memory for the central facts of a passage will be enhanced by the presence of related information as theorized in the encoding elaboration model (Anderson and Reder, 1979). This model states that comprehension and memorability are dependent on the process of elaboration that takes place during reading. In this explanation of

language and memory processing, a component of the ACT theory (Anderson, 1976), concepts are stored in a network as propositions. The network structure is multilevel and interactive with nodes representing concepts and links representing relations or associations. Elaborations establish more redundant encodings of the information. The greater the number of concepts on a given subject that are stored in memory, the more likely it is that the information can be retrieved and used. Related information promotes memory for text concepts through processing redundancy (Fredericksen, 1975; Reder, 1976/1977, 1979). Given elaboration at encoding (Anderson and Reder, 1979), access to memory for a superordinate is as likely to be cued from memory for a detail as access to memory for a subordinate is likely to be cued by memory for a major concept.

As reported previously (Freeman, 1985), connected discourse containing only central facts, a summary form, was more memorable to sixth grade readers than connected discourse containing central facts and antecedent supporting details, connected discourse containing central facts and consequent supporting details, and connected discourse containing central facts and unrelated supporting details. The study involved four text structures and four topics, 16 passages, in a Greco-Latin square design. Each subject read four passages, one passage in each text structure on a different topic. The subjects wrote free recalls immediately after

reading and at delay. The delayed recall included the four topics/structures. The results, along with those of Reder and Anderson (1980, 1982) failed to fulfill the expectations of the model.

Phifer, McNickle, Ronning, and Glover (1983) investigated the Anderson and Reder (1979) model and found that the presence of details enhanced recall of major idea units with both natural and artificial text. The experimental passages included unsupported main ideas and main ideas supported by one, two, or three details. Based on their passage structure and findings, the present study altered the discourse form (Freeman, 1983) so that a single passage contained unsupported central facts, central facts supported by antecedent details, and central facts supported by consequent details.

METHOD

Subjects

The subjects were 68 sixth grade students from three classes at the Oak Ridge Elementary School in the School District of the City of Royal Oak. Since four students were absent during the second session, the final sample contained 64 students.

Materials

A single passage was adapted from the four passages on one topic used in the first study (Freeman, 1983). The passage topic chosen for this study, Abraham Lincoln, had the highest mean recall in the original study. The four original Lincoln passages had a readability level (Fry, 1977) of grade seven. Validation studies verified the suitability of the passages for the subjects. The information contained in the passages was reported in definitive biographies on Abraham Lincoln. The material was about Lincoln's young adult life and was unknown to the subjects (Freeman, 1983).

The single paragraph passage of 450 words contained 42 idea units (Anderson, 1978): 18 central facts and 24 supporting details. Six central facts were unsupported, six central facts were supported by two antecedent causative details, and six central facts were supported by two consequent resulting details. Each supporting detail supported the central fact independently in relation to the other supporting detail for that central fact. The number of details supporting each central fact used in the text structures of this series of studies was shown by Phifer, McNickle, Ronning, and Glover (1983) to significantly support the memorability of the central fact. Each central fact, as well as each supporting detail, was one idea unit structured as a syntactically correct sentence. The central facts included in each condition were determined by random selection. The order of the central facts in the passage was

logical and sequential. The appropriate supporting details were selected from the original materials (Freeman, 1983) to meet the requirements of the text structure.

Procedures

Each subject participated in two experimental sessions. The subjects were instructed to read to remember, and be able to write, the information in the passage. The subjects were reminded to read the passage to understand it, then to study the information. The passage was distributed. The reading-study session lasted for 20 minutes. The passage was collected. The subjects were instructed to write everything they could remember. The recall session lasted 15 minutes.

Three days later, in an unannounced session, the subjects were asked to recall everything they had learned from the passage and write everything they could remember. The subjects were given twenty minutes to write.

Scoring

The immediate and delayed recalls were scored for the presence or absence of the 18 central facts. The text passage served as a template. Each idea unit (Anderson, 1978) had to be readily identifiable for scoring purposes. A second rater scored 23% of the recalls in each recall condition, selected at random. The interrater agreement was 99%.

Design

The independent variables in this within subjects design were the three text structures: unsupported central facts, central facts supported by antecedent causative details, and central facts supported by consequent resulting details. The number of central fact idea units in each text structure was the dependent variable. The recall conditions were immediate and delayed.

Results

Pearson Product-Moment Correlation Coefficients indicate a relation between the independent variables, but support the distinctiveness of each text structure.

Insert Table 1 about here

Two repeated measures analyses of variance indicate significant effects for text structure: [F (2,126) = 13.67, $p < .001$] in the immediate condition, [F (2,126) = 26.64, $p < .001$] in the delayed condition.

Insert Table 2 about here

Scheffé post hoc pairwise comparisons of the data in the immediate condition indicate significant differences between

unsupported and supported text structures: 1) unsupported central facts and central facts supported by antecedent causative details [F (1,126) = 12.58, $p < .001$], and 2) unsupported central facts and central facts supported by consequent resulting details [F (1,126) = 7.14, $p < .01$]. There was no significant difference between the two supported text structures. In the delayed condition, the mean recall was the same for the supported text structures. There was a significant difference on the Scheffé comparison between the unsupported text structure and either of the supported text structures [F (1,126) = 19.97, $p < .001$].

Discussion

The results of this study indicate strong support for the hypothesis that memory for the central facts of a passage is enhanced by the presence of related information. Examination of the immediate and delayed mean recall levels shows a reduced attrition rate for central facts supported by details compared to unsupported central facts. There is a loss of 4% for the central facts/antecedent details text structure from the immediate to the delayed conditions, an increase of 4.6% for the central facts/consequent details text structure, and a loss of 17% for the unsupported central facts text structure.

The greater memorability of central facts supported by antecedent and/or consequent details is predicted by the ACT theory

(Anderson, 1976) and the encoding elaboration model (Anderson and Reder, 1979). The findings of this study support those of Bradshaw and Anderson (1982) who found more significant memorability for central facts accompanied by supporting details in non-continuous text. In addition, the theory and the model are supported by the findings of the four experiments of Phifer, McNickle, Konning, and Glover (1983). The first two experiments determined the effect of the number of supporting details on the recall of major ideas in paragraphed and non-paragraphed passages; experiments three and four used the Reder and Anderson (1980) materials, adjusted the procedures to account for processing time, used free recall as the dependent measure, and found that details facilitate the recall of major ideas.

Additional support is derived from the current study in which the text variations are embedded in the same passage and free recall continues to be the means to assess idea unit memorability. This study differs from experiments one and two of Phifer, McNickle, Ronning, and Glover (1983) in that: 1) their material is not representative of textbook prose while the material of this study is intended to be representative of textbook prose, 2) their supporting details are subordinate sentences while the supporting details of this study are antecedent causative and consequent resulting, and 3) their recall was immediate while the recalls of this study were immediate and delayed. The findings of this study are in direct

contrast to earlier findings (Freeman, 1983, 1985) when each text structure was represented in a series of separate passages.

Significantly greater memorability for central facts supported by either antecedent causative details or consequent resulting details supports the premise that redundancy at encoding strengthens nodes and associations and promotes recall of the important ideas in informative expository prose. According to the Redundancy Hypothesis (Reder and Anderson, 1980), embellishments allow reconstruction of the main ideas; the details imply the main points. The arrangement of concepts is viewed as a network at all levels (Anderson, 1976), rather than a hierarchy with a relational structure. Given a central fact and two supporting details, the central fact can be inferred from the details.

The implication of these findings for the text structure of content area texts for upper elementary level students is that central facts should be supported by additional, supporting information that promotes elaboration at encoding. When central facts are processed to produce associations with related information in long term memory, the facts are more readily retrieved.

Table 1

Pearson Product-Moment Correlation Coefficients

for the Three Text Structures

in the Immediate and Delayed Conditions

	Central Facts/ Antecedent Details	Central Facts/ Consequent Details
Immediate Condition		
Unsupported Central Facts	0.38***	0.30**
Central Facts/Antecedent Details		0.37***
Delayed Condition		
Unsupported Central Facts	0.42***	0.21*
Central Facts/Antecedent Details		0.38***

*$p < .05$

**$p < .01$

***$p < .001$

Table 2

Means and Standard Deviations for Text Structure Recall

in the Immediate and Delayed Conditions

	$\bar{X}$	SD
Immediate Recall		
Unsupported Central Facts	1.91	1.15
Central Facts/Antecedent Details	2.80	1.40
Central Facts/Consequent Details	2.56	1.16
Delayed Recall		
Unsupported Central Facts	1.59	1.05
Central Facts/Antecendent Details	2.70	1.41
Central Facts/Consequent Details	2.70	1.18

REFERENCES

Anderson, J. R. (1976). Language, memory, and thought. Hillsdale, N.J.: Lawrence Erlbaum Associates.

Anderson, J. R. & Reder, L. M. (1979). An elaborative processing explanation of depth of processing. In L. S. Cermak & F. I. M. Craik (Eds.), Levels of processing in human memory. Hillsdale, N.J.: Lawrence Erlbaum Associates.

Anderson, T. H. (1978). Study skills and learning strategies. (Technical Report No. 104). Urbana: University of Illinois Center for the Study of Reading. (ERIC Document Reproduction Service No. ED 161 000.)

Bradshaw, G. L. & Anderson, J. R. (1982). Elaborative encoding as an explanation of levels of processing. Journal of Verbal Learning and Verbal Behavior, 21, 165-174.

Frederiksen, C. H. (1975). Representing logical and semantic structure of knowledge acquired from discourse. Cognitive Psychology, 7, 371-458.

Freeman, R. H. (1983). The role of text structure in the comprehension of information from prose passages. Unpublished doctoral dissertation, Oakland University.

Freeman, R. H. (1985). Memory for main ideas in varied patterns of connected discourse. In J. A. Niles & R. V. Lalik (Eds.), Issues in Literacy: A research perspective. Thirty-Fourth Yearbook of the National Reading Conference. Rochester, N.Y.: National Reading Conference.

Fry, E. (1977). Fry's readability graph: Clarification, validity, and extension to level 17. Journal of Reading, 21, 242-252.

Phifer, S. J., McNickle, B., Ronning, R. R., & Glover, J. A. (1983). The effects of details on the recall of major ideas in text. Journal of Reading Behavior, 15(1), 19-30.

Reder, L. M. (1977). The role of elaborations in the processing of prose. (Doctoral dissertation. University of Michigan, 1976.) Dissertation Abstracts International, 37(10), 5405B.

Reder, L. M. (1979). The role of elaboration in memory for prose. Cognitive Psychology, 11, 221-234.

Reder, L. M. & Anderson, J. R. (1980). A comparison of texts and their summaries: Memorial consequences. Journal of Verbal Learning and Verbal Behavior, 19, 121-134.

Reder, L. M. & Anderson, J. R. (1982). Effects of spacing and embellishment on memory for the main points of a text. Memory and Cognition, 10(2), 97-102.